



सत्यम् शिवम् सुन्दरम्

प्रसार भारती  
PRASAR BHARATI  
(Broadcasting Corporation of India)

दूरदर्शन महानिदेशालय  
Directorate General: Doordarshan

दूरदर्शन भवन, कोपरनिकस मार्ग,  
Doordarshan Bhawan, Copernicus Marg

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New Delhi - 110 001

**File No. 19(2)2018-19E1 (P) TV**

**Dated: 10.07.2019**

**Subject:** Draft Specification for Procurement of High Definition Waveform Monitor.

The Draft specification of the upcoming tenders is enclosed herewith to offer comments, if any and may also submit their budgetary quote by due date at e-mail address [ddpurchase401@yahoo.co.in](mailto:ddpurchase401@yahoo.co.in) or on following Address:


Assistant Engineer  
Room No. 403,  
Directorate General: Doordarshan,  
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New Delhi -110001 (India)  
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Specification For: Draft Technical Specification for Procurement of High Definition Waveform Monitor.

Specification no: SD 14/2019 Dated: 08.07.2019

Due Date to offer Comments: 25.07.2019

Encl.: As above (09 Pages)

  
10/07/19  
Prabhat Kumar Singh  
Assistant Engineer  
For DG: DD

PRASAR BHARATI  
India's Public Service Broadcaster  
DIRECTORATE GENERAL: DOORDARSHAN

**Specifications for High Definition Waveform Monitor**

Specifications No.: SD 14/2019

Dated: 08.07.2019

**1. SCOPE:**

The specifications lay down the performance requirement of HD-SDI Waveform Monitor for precise measurement and monitoring of Digital Video signal in Doordarshan Network.

**2. GENERAL:**

- (a) **The offered equipment should be from an internationally reputed manufacturer and the quoted model should be field proven and in use by leading broadcasters. The bidder should essentially submit the list of the broadcasters to whom the quoted model has been supplied. The tenders without the proper user list shall liable to be rejected.**
- (b) The waveform monitor should be modular in design and it should have HD-SDI and SD-SDI input module, EYE and Jitter display & measurement module.
- (c) The Waveform Monitor should be capable of being mounted in a standard 19" rack. The plug-in support/mounting hardware, cabinet etc. should also be quoted.
- (d) The offered Waveform Monitor should have all the standard features and should also have flexibility to add-on cards for up-gradations in future.

**3. ESSENTIAL FEATURES:**

- (a) It should be high precision HD and SD broadcast digital Waveform Monitor to display HD-SDI and SD-SDI signals (auto-detecting) with the capability of highly accurate measurement.
- (b) The waveform monitor should have two HD/SD-SDI inputs in any combination of High Definition and Standard Definition serial digital signals conforming to SMPTE 292M (HD-SDI: 1.485 Gb/s) and SMPTE 259M (SD SDI: 270 Mb/s).

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- (c) The waveform monitor should display waveform, vector, picture and status. In addition to these basic features, it should measure and monitor Eye pattern & Jitter.
- (d) The waveform monitor should display the wave form of both the input signals (HD/SD-SDI) simultaneously or the selected input as per the user requirement.
- (e) The Waveform Monitor should have an external Reference Input of Tri-level sync signal or PAL black burst.
- (f) The offered waveform monitor should have re-clocked SDI output of selected input.
- (g) The Waveform Monitor should have a bright, crisp colour TFT-LCD display with a resolution of 1024 x 768 (XGA) for live monitoring.
- (h) The offered waveform monitor should have the facility to display the component signals in Overlay and Parade mode.
- (i) The Waveform Monitor should be able to display input signals on a full screen or 4-screen multi displays. The multi screen display should allow various combinations of signals of different inputs to be displayed such as waveform display, vector display, picture display and status display.
- (j) The Waveform Monitor should have safe area, safe action and safe title marker display on the picture display to quickly verify correct placement of graphics, titles or logos.
- (k) The Waveform Monitor should have customizable presets to allow quickly saving commonly used configurations and should be able to store at least 30 presets and recall through the front panel, remote connector, and Ethernet network.
- (l) It should be possible to monitor SDI signal errors such as CRC errors of HD-SDI signals and EDH errors of SD-SDI signals as well as errors related to the embedded audio signals and ancillary data.
- (m) The waveform monitor should display the eye patterns and jitter waveforms of the selected SDI input signals in real time and measure jitter with timing cursors and necessary filters.
- (n) The waveform monitor should automatically measure eye pattern amplitude, rise time & fall time in the eye pattern display, timing jitter and alignment jitter.
- (o) The waveform monitor should be able to analyze and display ancillary data.
- (p) It should be possible to measure the level of the serial digital signal and display as equivalent length of coaxial cable.
- (q) It should be possible to detect transmission errors in the ancillary data.



- (r) The Waveform Monitor should have the feature of Vector display of the color difference signals.
- (s) The Waveform Monitor should have frame capture function and store the video data from an entire video frame and display this captured frame data on waveform, vector, gamut and picture displays.
- (t) The Waveform Monitor should be able to automatically capture frame data on the occurrence of specific faults or errors.
- (u) The Waveform Monitor should have front-panel USB Connector to store the presets and data.
- (v) It should have 10/100 Base T Ethernet interface with standard RJ-45 connector for remote control and monitoring.
- (w) The Suggestive Bill of Material (BoM) required is given in **Appendix-I (A)**. (The bidder is required to provide the complete list of items & accessories etc. offered to meet the specifications requirement in the following proforma:

Sr. No.	Description/Name of the item	Make	Model	Part No., if any	Qty.
1.	2.	3.	4.	5.	6.

- (a) The equipment are being procured for various Doordarshan centres as per **Appendix-II**.

#### 4. **TECHNICAL SPECIFICATIONS :**

##### 4.1 SDI Input

1.	Inputs	:	2, conforming to SMPTE 292M (HD-SDI: 1.485Gb/s) and SMPTE 259M (SD SDI: 270 Mb/s).
2.	Input Connector	:	BNC 75 $\Omega$
3.	Input level	:	800 mVp-p $\pm$ 10%.
4.	Return loss	:	$\geq$ 15 dB (5 MHz to serial clock frequency)

##### 4.2 SDI Output

1.	Signal	:	Serially re-clocked output of the selected input signal.
2.	Output Connector	:	BNC 75 $\Omega$
3.	Output level	:	800mVp-p $\pm$ 10%
4.	Return loss	:	$\geq$ 15 dB (5 MHz to serial clock frequency)

#### 4.3 External Reference

1.	Input Signal	:	Tri-level sync signal or PAL black burst
2.	Input Connector	:	BNC 75 $\Omega$
3.	DC Input Impedance	:	15 k $\Omega$
4.	Return loss	:	$\geq 30$ dB

#### 4.4 Waveform Vertical Characteristics

1.	Frequency Response - HD		
(i)	Luminance Channel (Y)	:	$\leq \pm 0.5$ % (1 MHz to 30 MHz)
(ii)	Chrominance Channel	:	$\leq \pm 0.5$ % (0.5 MHz to 15 MHz)
2.	Frequency Response - SD		
(i)	Luminance Channel (Y)	:	$\leq \pm 0.5$ % (1 MHz to 5.75 MHz)
(ii)	Chrominance Channel	:	$\leq \pm 0.5$ % (0.5 MHz to 2.75 MHz)
3.	Amplitude Accuracy	:	$\leq \pm 0.5$ %
4.	Gain	:	X1, X5 and X10

#### 4.5 Eye Pattern and Jitter Display

1.	Type	:	Equivalent time sampler
2.	Formats	:	HD /SD conforming to SMPTE 292M and SMPTE 259M
3.	Vertical Scale Accuracy	:	800 mV $\pm 5$ % (for 800 mV input)
4.	Jitter filter	:	10 Hz, 1 KHz & 100 KHz

#### 4.7 Display

1.	Screen type	:	TFT/LCD
2.	Resolution	:	1024 x 768 or better
3.	Screen Size	:	6.3" or better
4.	Format	:	XGA

#### 4.8 Power Supply & Operating Temperature

1.	Input	:	230 $\pm 5$ % V AC, 50 Hz
2.	Operating temperature	:	0 Deg. C to 40 Deg. C

### 5. ACCESSORIES:

All essential accessories such as power cables, connectors etc. required to complete the system should be offered by the firm and the firm should certify the completeness of the system in all respect. All the optional items should be quoted separately. The firm must provide enough details about such optional item to decide its utility.

## **6. COMPLIANCE:**

- (a) A point by point full compliance statement in respect to all the parameters related to the concerned equipment/item(s) laid down in the specifications from the respective principal manufacturers is to be enclosed along with the offer in the format given below. Mere signature on the copy of DD specifications shall not be accepted as a compliance statement.

The figures so mentioned should be supported by record of these in the technical literature enclosed with the tender and reference to the page number of enclosed literature for all features and technical specifications should be mentioned in the relevant column. Offers without the compliance statement or with incomplete compliance statement will liable to be rejected with the sole responsibility of the bidder. **Any deviation from the specification detailed in the compliance statement is to be highlighted separately.**

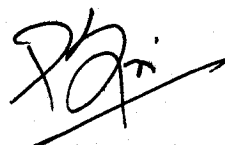
Sr. No of DD specs.	DD specs.	Compliance (Yes/No)	Performance Fig. of equipment Offered.	Reference to the Page Number of enclosed literature	Deviations, in case of non-compliance	Optional items if any reqd. to make the sys. Compliant to DD specs.	Features in the offered Product which exceeds DD specs.
1	2	3	4	5	6	7	8

- (b) In addition to above, a separate point by point compliance statement duly signed by the bidder in respect of all the points laid down in the specifications for all the equipment/item(s) should also be submitted alongwith the bid by the bidder in the above mentioned proforma.

## **7. TECHNICAL LITERATURE:**

One set of technical manuals/brochures for all the equipment are required to be provided along with the tender to facilitate the technical evaluation, otherwise the tender is liable to be ignored. The successful bidder will have to supply a set of technical, user and installation manuals with respect to each of the equipment.

## **8. DEMONSTRATION:**



If necessary, the bidder may be asked for demonstration of the offered system as part of the technical evaluation. In such case the bidder will have to make suitable arrangement for the demonstration of the offered system at Doordarshan Bhawan, New Delhi, on notice of 15 days. Accordingly the bidder should be in readiness for demonstration.

**9. GUARANTEE:**

- a) With reference to the clause no.8.2 of the "General Terms And Conditions (GTC)" under ANNEXURE-II of tender document, the complete system including all items/equipment should be guaranteed for **three years** of trouble free operation from the date of commissioning. In case of any item or equipment failure including software and hardware within this period shall be rectified or replaced free of cost to Doordarshan.
- b) The guarantee should cover all hardware, software and modules of the complete system.

**10. TRAINING:**

The bidder should offer 03 days operation and maintenance training on the offered equipment for Doordarshan Engineers. The bidder has to provide the comprehensive training material in the form of hard copies, as well as soft copies to the trainees during the training session.

The training will be conducted at one Doordarshan Centre in each concerned Zone as indicated in **Appendix-I (B)**.

**11. DELIVERY PERIOD:**

The delivery period will be 03 months.

**12. INSPECTION:**

The equipment shall be subjected to inspection by Doordarshan officials at New Delhi.

**13. ENCLOSURES:**

The bidder must necessarily upload the following documents along with the technical bid:

- a) Compliance statement with respect to all the points of the specifications duly signed by the OEM should be submitted for offered equipment/item(s) in the proforma mentioned in clause no. 6.(a). The reference to the page number of enclosed literature for all features and



technical specifications should be essentially mentioned in the relevant column of the compliance statement.

- b) A separate point by point compliance statement duly signed by the bidder in respect of all the points laid down in the specifications for the offered equipment/item(s) in the proforma mentioned in clause no. 6.(b).
- c) Technical manuals/detailed technical literature/catalogues for the offered equipment/item(s) for substantiating the model no. and technical specifications.
- d) Model specific user list of the offered product(s).
- e) Any other document mentioned elsewhere in the tender document.

**The tender is liable to be rejected in the absence of the above enclosures with the sole responsibility of the bidder.**

\*\*\*\*\*

A handwritten signature in black ink, appearing to be 'P. An', is written over a horizontal line.



**Appendix-1(A)**

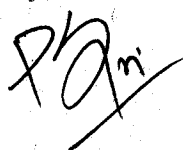
**Suggestive Bill of Material**

<b>Sl Nos.</b>	<b>Details of Items</b>	<b>Qty.</b>
1.	Dual HD/SD SDI input Digital Waveform Monitor with Cabinet	14 Nos.
2.	19" Rack mounting arrangement for two Waveform Monitors in each rack frame	9 Nos.
3.	Blank panel for rack mount frame	4 Nos.
4.	EYE and Jitter Display & Measurement Option	14 Sets
5.	Operation manual/User Guide/ Technical Manual/ Installation Manual etc.	14 Sets
6.	Service & Maintenance Manuals	14 Sets
7.	3 days Operation & Maintenance Training	1 Job

**Appendix-I(B)**

**TRAINING LOCATIONS:**

The training will be conducted at only one location in North Zone. The exact name of Doordarshan Centre will be decided at the time of finalizing the training schedule.



**Appendix-II**

**EQUIPMENT ARE BEING PROCURED FOR THE FOLLOWING  
DOORDARSHAN CENTRES**

<b>Sl. No.</b>	<b>Zone</b>	<b>Location of Doordarshan Centre</b>	<b>Total Qty.</b>	<b>Item Nos. 1,4,5 &amp; 6</b>	<b>Item No.2</b>	<b>Item No.3</b>
1.	<b>North Zone (NZ)</b>	CPC, Delhi	4 Sets	4 Nos.	3 Nos.	2 Nos.
2.		DD News, Delhi	10 Sets	10 Nos.	6 Nos.	2 Nos.
		<b>TOTAL QTY.</b>	<b>14 Sets</b>	<b>14 Nos.</b>	<b>9 Nos.</b>	<b>4 Nos.</b>

*PQn*